

ADDITIONAL NOTES ON THE GENUS LIPPIA. III

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Acronyms for the names of herbaria used in this and all others in my series of notes on this and other genera of Verbenaceae, Avicenniaceae, and Eriocaulaceae in PHYTOLOGIA are fully explained in my "Fifth Summary" (1971), pp. 795—801, and its subsequent supplements in PHYTOLOGIA, vols. 23, 25, 26, 28, 31, 34, and 36 (1972—1977).

LIPPIA Houst. ex L., Gen. Pl., ed. 1, 347 (1737), Sp. Pl., ed. 1, imp. 1, 2: 633 (1753), and Gen. Pl., ed. 5, 282. 1754.

Additional & emended synonymy: Zipania Pers., Syn. Pl. 2: 140. 1807. Dipterocalyx Cham. & Schlecht. ex Spach, Hist. Nat. Veg. Phan. 9: 227. 1840. Zapamia Juss. ex Steud., Nom. Bot., ed. 2, 2: 797. 1841. Zapania Schau. ex Buek, Gen. Spec. Syn. Candoll. 3: 507, in syn. 1858. Lippia Endl. ex Arcang., Compend. Fl. Ital., ed. 1, 561. 1882. Hippia Bourgeau ex Moldenke, Alph. List Inv. Names Suppl. 1: 10, in syn. 1947 [not Hippia Dalechev., 1872, nor Kunth, 1820, nor L., 1767, nor L. f., 1781]. Lippia (Houst.) L. ex Fournier, Quatre Fl. France 806. 1961. Lipia Espinal T., Vis. Ecolog. Dept. Valle 41. 1965 [not Lipia Sessé & Moc., 1940]. Zapamia Steud. apud Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 7, 1207, in syn. 1966. Lippidia Cham. ex Moldenke, Résumé Suppl. 17: 11, in syn. 1968. Lipea Anon., Biol. Abstr. 52 (2): B.A.S.I.C. S.135, sphalm. 1971. Lippica R. F. Sm. ex Moldenke, Fifth Summ. 2: 568, in syn. 1971. Dipterocaly (Cham.) Schau. ex López-Palacios, Revist. Fac. Farm. Univ. Los Andes 15: 56, sphalm. 1975. Zapania "Juss. ex Steud." apud Soukup, Biota 11: 13, in syn. 1976. Zapamia Post & Kuntze ex Moldenke, Phytologia 34: 280, in syn. 1976.

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Pl. Nuev. Españ., ed. 1, 1: 416 (1790) and 3: 492. 1790; Haenke in L., Gen. Pl., ed. 8 [10], 2: 531—532 & 800. 1791; Poir. in Lam., Tabl. Encycl. Méth. Bot. [Illustr. Gen.] 1: 58—59, pl. 17, fig. 3. 1791; Schreb. in L., Gen. Pl., ed. 3 [9], 2: 399 & 858. 1791; J. F. Gmel. in L., Syst. Nat., ed. 13, imp. 2, 2: 42, 887, & 955—956. 1796; Rausch., Nom. Bot., ed. 3, 390. 1797; Willd. in L., Sp. Pl., ed. 4, 3: 319. 1800; Anon., Ann. Mus. Natl. Hist. Nat. Paris 1802: 253. 1802; Batsch, Tabl. Aff. Reg. Veg. 193. 1802; L. C. Rich. in Michx., Fl. Bor.-Am., imp. 1, 2: 15 & 337. 1803; Desf., Tabl. Écol. Bot., ed. 1, 54. 1804; Pers., Syn. Pl. 2: 139—140. 1807; Willd., Enum. Pl. Hort. Berol. 2: 652. 1809; Desf., Tabl. Écol. Bot., ed. 2, 65. 1815; H.B.K., Nov. Gen. & Sp. Pl., ed. folio, 2: 212—218 (1817) and ed. quart., 2: 260—269. 1818; Pers., Sp. Pl. 3: 351, 352, & 354. 1819; S. Ell., Sketch, imp. 1 & 2, 2: 101 (1821) and imp. 2, 2: 733. 1824; Sweet, Hort. Brit., ed. 1, 1: 324 & 325. 1826; Spreng. in L., Syst. Veg., ed. 16 [cur. Post], 4 (2): 231. 1827; Reichenb., Icon. Bot. Exot. 2: 3 & 27, pl. 169. 1828; G. Don in Loud., Hort. Brit., ed. 1, 246. 1830; Purkinje, De Cell. Anther. Fibros. 42, pl. 7, fig. 11. 1830; Sweet, Hort. Brit., ed. 2, 418 & 419. 1830; Cham., Linnaea 7: 213—243, 253, & 375—377, pl. 7, fig. C & D. 1832; G. Don in Loud., Hort. Brit., ed. 2, 246. 1832; Loud., Hort. Brit., ed. 2, 553. 1833; Hook., Comp. Bot. Mag. 1: 349. 1836; Hook. & Arn., Bot. Beech. Voy. 207 (1836) and 305. 1838; Harv., Gen. S. Afr. Pl., ed. 1, 267 & 268. 1838; D. Dietr., Taschenb. Ausländ. Arzneigw. 221 & 319. 1839; G. Don in Loud., Hort. Brit., ed. 3, 246. 1839; J. Grah., Pl. Bomb. 154, 156, & 158. 1839; Sweet, Hort. Brit., ed. 3, 552 & 553. 1839; Thwaites, Enum. Pl. Zeyl. 2: 241. 1839; Spach, Hist. Nat. Veg. Phan. 9: 227, 235, 242, & 243. 1840; Hook. & Arn., Bot. Beech. Voy. 442. 1841; Otto & Dietr., Allg. Gartenzeit. 10: 315 & 316. 1842; Bertol., Fl. Ital. 6: 265. 1844; Voigt, Hort. Suburb. Calc. 472 & 473. 1845; Lindl., Veg. Kingd. 663. 1846; Schau. in A. DC., Prodr. 11: 535, 556, 557, 572—594, & 608. 1847; Schau., Linnaea 20: 479—480. 1847; A. Wood, Class-book, ed. 2, imp. 1, 411, 413, & 641 (1847), ed. 2, imp. 2, 411, 413, & 641 (1848), and ed. 10, imp. 1, 411, 413, & 641. 1848; Beck, Bot., ed. 2, imp. 1, 285. 1848; A. Gray, Man. Bot. North. U. S., ed. 1, 312 & 705. 1848; Hassk., Fl. Jav. Rar. 487. 1848; C. Gay, Hist. Fis. Chile Bot. 5: 27—33. 1849; Hook. f. & Benth. in Hook., Niger Fl. 485. 1849; A. Wood, Class-book, ed. 10, imp. 2, 411, 413, & 641 (1849), ed. 10, imp. 3, 411, 413, & 641 (1850), ed. 17, 411, 413, & 641 (1851), ed. 23, 411, 413, & 641 (1851), ed. 29, 411, 413, & 641 (1853), ed. 35, 411, 413, & 641 (1854), and ed. 41, imp. 1, 411, 413, & 641. 1855; E. Twining, Ill. Nat. Ord. Pl. 2: 104. 1855; Beck, Bot., ed. 2, imp. 2, 285. 1856; A. Gray, Man. Bot. North. U. S., ed. 2, imp. 1, 299 & 717. 1856; Schnitzl., Iconogr. Fam. Nat. 2: 137 Verbenac. [2] & [3]. 1856; A. Wood, Class-book, ed. 41, imp. 2, 411, 413, & 611. 1856; A. Gray, Man. Bot. North. U. S., ed. 2, imp. 2, 299 & [619]. 1858; Buek, Gen. Spec. Syn. Candoll. 3: 252—253, 265—267, 494, 495, & 507. 1858; A. Gray, Man. Bot. North. U. S., ed.

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It is interesting to compare the generic descriptions given for this genus by various authors over the years. Gay (1849) says "Calyx campanulatus tubulosusve et 4-dentatus, aut compressus, bialatus, bifidus, lobis bidentatis, demum bivalvis. Corollae bilabiatae et ad faucem dilatatae, labio superiore emarginato-bilobo, inferiore trifido. Stamina 4, inclusa, didynama, fertilis. Ovarium biloculare, loculis uniovulatis. Stylus terminalis; stigma subterminale, obliquum. Drupa sicca, bilocularis, bipartibilis.....Yerbas frutescentes, suborbustos, ó arbustos tendidos, ó levantados, vestidos de hojas opuestas ó ternadas, sencillas, enteras ó dentadas. Flores en cabezuelas apretadas, axilares, pedunculadas ó en panoja. Cáliz campanulado y tubuloso, cuadridentado, ó comprimido, bialado, bicarenado, bífido, con los lóbulos bidentados, separándose cuando maduros en dos ventallas. Tubo de la corola dilatado hácia la garganta, con dos labios, el superior escotado y bilobulado y el inferior con tres. Cuatro estambres didinamos, inclusos, todos fértiles, con los filamentos cortos y las anteras biloculares. Ovario bilocular, uniovulado y superado de un estilo terminado por un estigma oblicuo. Cápsula con dos cocas unidas ó separadas en la madurez."

Schauer (1851) modified this to "Flores capitati vel spicati, singuli singula bractea suffulti. Calyx (parvus) membranaceus, tubulosus, bialatus v. bicarinatus aut ecarinatus, bifidus lobis magis minusve conspicue bidentatis et denique saepius bivalvis vel subaequaliter 4-dentatus, hirsutus aut villosus. Corolla tubuloso-infundibuliformis; tubus sursum ampliatus, interdum ventricosus; limbus obliquus planus vel inclinatus subbilabiatus, labio superiori integro aut bifido, inferiori trifido lobis vel subaequaliter vel medio majori. Stamina 4, corollae tubo inserta et inclusa didynama; filamenta brevia; antherae biloculares, loculis parallelis adpostis rima hainte dehiscens. Germen biloculare, loculis uniovulatis; ovulo ad angulum internum basifixo, extrorsum anatropo. Stylus terminalis, brevis filiformis aut subcolumnaris; stigma citra apicem styli laterale, lineare, declive. Capsula dicocca. Calyce bivalvi adherente, vel integro tecta, subsecta vel nuda; pericarpium pergamentaceum vel durum immo interdum subosseum; cocci maturitate sua sponte secedentes aut cohaerentes, separabiles tamen, dorso laevi, commissura plana vel excavata granulata. Embryi cotypedones crassae. Bostello infero brevissimo. Herbae vel saepius frutices et suffrutices, loca campestris aprica et silvas aestu aphyllas anantes, erecti, procumbentes, vel repentes, indumento aut villosa aut strigosa et aspero aut glanduloso-viscido praediti saepissima glandulis punctiformibus oleo aromatico scatentibus sub indumento conspersi aut iisdem partim vel omnino dense obducti et tum siccitate ferruginosi. Caulis ramique tetragoni. Folia opposita vel verticillata, simplicia, penninervia, basi saepius triplinervii, plerumque nervis venisque supra impressis lineata et vinoso-rugosa saepius reti crasso subtus foveolata,

crenata v. serrata nec nisi rarissime integerrima, compluribus perennis, paucis iisque campos aestu crematos habitantibus annua. Inflorescentia vel simplex axillaris, vel composita terminali-paniculata. Capitula in multis densissima hemisphaerica v. subglobosa v. tetragona, per anthesis paullo relaxanda et elongata in aliis per varios transitus sensim in spicas laxas et racemos flaccidos abeuntia. Bractee imbricatae herbacae aut membranacae, concavae vel complicato-carinatae et interdum basi connatae, saepius pallidae calyceque plerumque paullo majores in quibusdam magna subpetaloideo-coloratae, semper subfructu persistentes. Flores plerumque sessiles in racemosis vero breviter pedicellati, parvi quin perexigui, paucis majusculi. Calyx plerumque dense villosus fructui adhaerens nec nisi rarissime ante ejus maturitatem albescens. Corolla alba, lutescens aut rubescens, tubo recto vel inclinato ad staminum insertionem ventricosus. Capsula subglobosa vel oblonga, opaca, rarius nitida, saepissime parva cocco altero saepe tabescente."

Harvey (1868) abbreviates this really excellent detailed description of the genus (sens. lat.) to "Calyx small, tubular, 2-winged 2-keeled or plain, 2-fid, the lobes more or less 2-toothed, at length commonly 2-parted. Corolla somewhat funnel-shaped; tube widening upwards; limb oblique, 4-lobed, sub-2-labiate, the upper lip entire or 2-fid, lower 3-fid. Stamens 4, included, didynamous; anther-cells parallel. Ovary 2-celled; cells 1-ovuled; style short; stigma lateral. Fruit of 2 separating or cohering pieces, dry, girt with the often 2-parted calyx....Herbs or shrubs, mostly American, very generally strongly scented. Flowers capitate or spiked, small, usually subtended by large bracts. Leaves opposite or whorled."

Baker (1877) reduces this still further to "Calyx membranous, campanulate; segments 4. Corolla with a cylindrical tube and obscurely bilabiate limb, with 5 rounded lobes. Stamens 4, didynamous. Ovary 2-celled, globose; cells 1-ovulate; style simple; stigma capitate. Fruit ovoid, dry, separating into 2 pyrenes. — Herbs. or shrubs, with simple opposite leaves and minute flowers arranged in axillary spike or capitula." In his 1900 work he recognized the need to amplify this description to read: "Calyx small, membranous, 2—4-lobed, compressed and 2-keeled in the Tropical African species. Corolla-tube cylindrical; limb patent, obscurely bilabiate, with 4 round lobes. Stamens didynamous, inserted about the middle of the corolla, included or just exserted. Ovary 2-celled; cells 1-ovuled; style short; stigma oblique or recurved; ovules inserted at or near the base of the cells. Fruit without any fleshy layer outside the two bony pyrenes. Seeds exalbuminous. — Undershrubs, rarely herbs, usually more or less hairy and glandular. Leaves opposite, ternate or verticillate. Spikes dense, small, globose or oblong in the Tropical African species. Flowers small, each subtended by a persistent bract."

Pearson (1901), based on his more intensive study of the genus in connection with his monographic work on the family as a whole,

amplifies this still more to "Calyx small, membranous, ovoid-campanulate or compressed, 2-4-lobed, 4-toothed, more or less truncate, 2-keeled, slightly accrescent, ultimately 2-valved enclosing (sometimes adhering to) the fruit. Corolla with cylindric, straight or curved tube, somewhat widened at the throat, rarely shorter than the bract; limb spreading, oblique, more or less 2-lipped, 4-lobed; lobes broad, frequently emarginate, the anterior (lower) being somewhat larger than the posterior (upper) and the 2 lateral equal and smaller than the posterior. Stamens 4, didynamous, inserted near the middle of the corolla-tube, included or somewhat exerted; anthers ovate, with parallel cells. Ovary of 1 carpel, 2-celled; cells 1-ovuled; ovule erect, inserted at or near the base of the cell; style usually short; stigma terminal, oblique or recurved, thickened. Fruit small, with a hard dry epicarp, enclosed in the slightly accrescent, closely appressed calyx; endocarp hard and bony, easily separated (or falling asunder spontaneously) into 2 1-seeded portions (pyrenes). Seeds exalbuminous. Shrubs or undershrubs, rarely herbs, with variously hairy, rarely glabrous epidermis; leaves opposite or in whorls of 3 (occasionally 4), rarely alternate; spike slender, elongate and lax, cylindric and dense, or short, and subglobose, becoming more or less cylindric as the fruit matures; flowers small, sessile, solitary in the axils of broadly imbricate (in the denser spikes) or small bracts."

Going now to Asia, we find Prain (1903) characterizing the genus as "Shrubs or undershrubs, rarely herbs; leaves opposite or ternately whorled, rarely alternate, simple, entire or lobed, smooth or rugose. Flowers in elongated, slender, or dense spikes, or small heads; bracts in slender spikes small, in dense spikes the heads conspicuous, wide-imbricate; bracteoles 0. Sepals in a small, membranous, ovoid, campanulate or compressed and 2-ridged calyx; limb 2-fid or 4-fid or 4-toothed. Petals 4-5, connate in a somewhat 2-lipped corolla; tube cylindric, straight or curved; limb oblique, upper lobe wider, emarginate or slightly 2-lobed, lower lobes wide, often retuse. Stamens 4, didynamous, included; anthers ovate or broadly oblong. Carpels [note! Pearson and Troncoso aver that the pistil is 1-carpellary] connate in a 2-celled ovary; ovules in each cell solitary, erect from the base, or laterally attached near base of cell; style short; stigma obliquely subcapitate. Fruit small, dry, separating into two 1-seeded pyrenes. Seeds without albumen; radicle inferior."

Presumably all these authors included Acantholippia, Aloysia, and Phyla in their concept of Lippia, but Macbride (1960) is one of the first specifically to say so: "Much like Lantana but often less harshly pubescent if at all, the trichomes in some herbs malpighiaceae, the spikes often elongate (Aloysia) or subcapitate and rather few-flowered, less frequently subcapitate, compact. Bracts not or more or less 4-ranked, persisting to deciduous, the calyx either compressed, bicarinate or bialate (bracts persisting) or 2-4-angled or cleft or 4 dentate (former,

Phyla; latter, Aloysia). Corolla limb oblique, often sub-bilabiate. Fruit at least typically included, dry, the nutlets rarely free. — Has been united with Lantana but the mature fruit and often the calyx provide identification. In Peru the inflorescence is solid (Phyla) or if capitate more or less open, otherwise spicate."

Returning to the African workers, Dale & Greenway (1961) feel that the following characters are sufficient to distinguish the genus [at least, one supposes, in their geographic area]: "More or less hairy and glandular herbs and undershrubs with opposite or ternate or verticillate leaves. Flowers small and white in dense spikes, calyx 2—4-lobed compressed and 2-keeled, corolla tube cylindrical with 4 rounded lobes and obscurely bilabiate; stamens didynamous; ovary of 2 cells with 1 ovule in each. Fruit of 2 bony nutlets."

A distinguished Japanese botanist, Ohwi (1965), characterizes the genus as "Shrubs or herbs, glabrous or with simple hairs; leaves opposite, sometimes verticillate, toothed or entire; inflorescence spicate; flowers small, sessile, solitary in axils of bracts; calyx small, sometimes bilabiate or 2-winged, 2- or 4-lobed; corolla tubular, the limb ascending and spreading, 5-lobed; stamens 4; anther-locules parallel; ovary 2-locular; ovules solitary in each locule; stigma rather thick; nutlets 2."

Another distinguished worker on the genus, Troncoso (1965), characterizes it thus: "Flores hermafroditas o por aborto diclinas. Cáliz pequeño, tubuloso, 2—4-dentado, generalmente 2-carenado o 2-alado, entero, hendido o 2-partido, a veces reducido a 2 escamitas membranáceas. Corola zigomorfa, limbo oblicuo, 2-labiado, labio anterior reducido, entero o emarginado, labio posterior 3-lobado, lóbulo medio mayor, tubo corolar breve. Estambres 4, didínamos, insertos sobre el tubo corolar, incluidos; anteras 2-loculares. Ovario unicarpelar, 2-locular, lóculos uniovulados, óvulos anátropos; estilo terminal, breve; estigma lateral. Fruto esquizocárpico, formado por 2 mericarpios separables a la madurez o subcoherentes. Semillas exalbuminosas. Arbustos o subarbustos generalmente aromáticos, con glándulas resinoso-punteadas en hojas, cáliz y brácteas. Hojas opuestas o ternadas, enteras, dentadas o serradas. Inflorescencia capituliforme en espigas contraídas, solitarias o agregadas, o en panojas terminales laxas, alargadas. Género de regiones tropicales y templadas de América y África." It also occurs in tropical Asia.

A very recent characterization is that of Friedrich-Holzhammer and his associates (1967): "Halbsträucher mit aufrechten, verlängerten Ästen, dicht steifhaarig oder nur spärlich behaart, stark drüsig. Blätter gegenständig oder zu 3—4 wirtelig, schmal-elliptisch, lanzettlich oder länglich-lanzettlich, in einem sehr kurzen Stiel verschmälert, ganzrandig bis gezähnt, 2—8 cm lang, 0.5—2 cm breit. Blüten in blattachselständigen, gestielten, dichten, köpfchenförmigen Ähren, mit eiförmig-spitzen, den Kelch überragenden Tragblättern, fast radiär bis ± zygomorph. Kelch becherförmig, ca. 1—1,5 mm lang, mit gestutztem bis etwas

geschweiftem Saum. Krone weiss bis gelblichweiss mit gelbem Schlund, mit ca. 3 mm langer, nur am Grunde enger, dann trichterförmig erweiterter Röhre und 4 rundlichen Saumlappen. Staubblätter im erweiterten Teil der Kronröhre inseriert, mit sehr kurzen Filamenten, nicht herausragend. Fruchtknoten zweifächerig; Griffel kurz, mit schiefer Narbe. Frucht eine etwa kugelige, in 2 einsamige Hälften zerfallende Spaltfrucht." It would appear that this description is drawn only from the Namibian members of the genus.

Sanchez (1969) says "Cáliz pequeño, membranoso, acampanulado. Corola con el tubo cilíndrico, recto o curvo, con el limbo algo bilabiado, 2—4 partido. Estambres 4, didínamos, inclusos, insertos en el tubo de la corola. Ovario bilocular, con un óvulo en cada división. Fruto pequeño y seco que se disgrega en 2 frutitos parciales monospermos. Arbustos o plantas subarborescentes, con las hojas alternas u opuestas, enteras o partidas y las flores agrupadas en espigas cortas o cabezuelas."

As to subdivision of the genus, it is also interesting to compare the systems of various experts. Schauer (1851) divided Lippia as follows:

"Sectio I. Racemi vel spicae laxi. Calyx inaequaliter 4-fidus. Aloysia.....

Sectio II. Capitula densa tetraquetra, pedunculata, geminaplurima axillaris. Goniolippia.....

Sectio III. Capitula densa plurifariam imbricata, saepius squarrosa. Calyx compressus, bicarinatus vel bialatus, longe ciliatus, breviter bifidus. Dipterocalyx.....

Sectio IV. Capitula densa plurifariam imbricata. Bracteeae neque magnae post anthesin auctae. Calyx brevitybulosus membranaceus. Zapania.....

§ 1. Capitula axillaria. Axilliflorae.....

§ 2. Capitula densa terminali-paniculata. Paniculatae.....

§ 3. Capitula adulta subspicata vel subracemosa, laxa, corymboso-paniculata. Corymbosae.....

Sectio V. Capitula magna, subglobosa, aequaliter imbricata.

Bracteeae membranaceae, latae, petaloideae, purpurascens, post anthesis demum conspicue auctis. Rhodolippia.....

Dalla Torre & Harms (1963) included Phyla Lour., Platonia Raf., Bertolonia Raf., Panope Raf., Piarimula Raf., and Cryptocalyx Benth. as generic synonyms and divided the genus as follows:

Subg. I. Aloysia Schau. (syn.: Aloysia Ort. & Palau)

Subg. II. Zapania Benth. (syn.: Zapania Lam., Zappania Zuccagni, and Zapamia Steud.)

§ 1. Gonostachyum Schau. (syn.: Goniostachyum Schau.)

§ 2. Acantholippia Briq. (syn.: Acantholippia Griseb.)

§ 3. Dipterocalyx Schau. (syn.: Dipterocalyx Cham.)

§ 4. Euzapania Briq.

A. Axilliflorae Schau.

B. Panniculatae Schau.

C. Corymbosae Schau.

§ 5. Rhodolippia Schau.

Troncoso (1974) keys out the divisions of the genus as accepted by her:

- "A. Cáliz comprimido, subcarenado o bialado, fácilmente bipartido, con carenas o alas largamente pestañosas.
- B. Cabezuelas axilares densas, globosas, solitarias o geminadas o formando panojes foliadas, pedunculadas. Brácteas pluri-seriadas (8 filas). Cáliz 2-carenado pero no alado. Sect. 1. Lippia.
- B'. Cabezuelas hemisféricas durante la antesis, subcilíndrico-espiciformes en la fructificación, dispuestas en densas panojas o corimbos terminales extendidos. Brácteas hexásticas. Cáliz bialado, alas vesiculadas. Sect. 2. Dipterocalyx.
- A'. Cáliz brevemente tubuloso, a veces ligeramente compreso, pubescente o glabro, o reducido a dos hojitas diminutas, tenues, por lo general inconspicuas. Cabezuelas pedunculadas o subsésiles, que se alargan brevemente después de la antesis.
- B. Flores violáceas, lilacinas, rosadas o blancas, hermafroditas. Arbustos o subarbustos, menos comúnmente hierbas perennes.
- C. Brácteas pequeñas, verdosas, que no ocultan las corolas.
- D. Cabezuelas numerosas, 4--6 por axila, por lo general subpéndulas. Brácteas cóncavas, imbricado-decusadas, tetrásticas, plegado-carenadas, libres o connatas en la base o hasta su mitad. Sect. 3. Goniostachyum.
- D'. Cabezuelas solitarias, geminadas o en racimos o corimbos terminales. Brácteas planas o subcóncavas, polísticas. Cáliz tubuloso, a veces bifido o reducido a dos hojitos diminutas. Sect. 4. Zapania.
- E. Cabezuelas axilares, solitarias o geminadas, breve o largamente pedunculadas. Serie 1. Axilliflorae.
- E'. Cabezuelas dispuestas en inflorescencias terminales racimoso-paniculadas o en corimbos densos axilares, agrupados en el ápice de las ramas.
- F. Cabezuelas adultas subglobosas u ovoides agrupados en racimos o panojas subpiramidales. Hierbas perennes. Cáliz bifido, muy villosa. Serie 3. Paniculatae.
- F'. Cabezuelas adultas subespiciformes, corimboso-paniculadas en el ápice de las ramas. Serie 4. Corymbosae.
- C'. Brácteas grandes, coloreadas, membranáceas, venoso-reticuladas, que cubren o no las corolas.
- D. Cabezuelas 'lupulinas' globosas, con grandes brácteas involucrales que cubran las flores, por lo común axilares, solitarias. Flores sésiles. Sect. 5. Rhodolippia.

D'. Cabezuelas espiciformes, laxas después de la antesis, con brácteas oblongo-lanceoladas que no ocultan totalmente las flores, de inserción por lo general supraxilar. Flores brevemente pediceladas. Sect. 6. Pseudoalloysia.

B'. Flores amarillas o amarillo-anaranjadas, dioicas por aborto. Hierbas perennes, a menudo con xilopodio. Cabezuelas solitarias axilares o en racimos terminales subpaniculados. Sect. 7. Dioicolippia."

Another contemporary diligent student of the group, López-Palacios (1975), divides the genus as follows:

"1 Cabezuelas grandes, primero semiglobosas, involucradas, de brácteas iguales, anchas, membranáceas, delgadas, de color lila o rosa, muy alargadas y reticuladas después de la antesis.....Sect. Rodolippia Schau. & Briq.

1a Cabezuelas más pequeñas y diferentes de las descritas en 1; brácteas más pequeñas, no alargadas después de la antesis:

2 Brácteas decusadas, plegadas....Sect. Goniostachyum Schau.

2a Brácteas en muchas filas, imbricadas:

3 Cáliz comprimido, con una ala estrecha y pubescente a ambos lados, cortamente bifido; cabezuelas que frecuentemente forman panículas en los hojas superiores reducidas; fruto incluido en el cáliz. Sect. Lippia [= Dipterocaly (Cham.) Schau.]

3a Cáliz corto-tubuloso, a veces comprimido, no alado.... Sect. Euzapania Briq.

4 Cabezuelas maduras espigadas, agrupadas en umbelas paniculadas....Subsect. Corimbosae (Schau.) Briq.

4a Cabezuelas no espigadas ni en umbelas paniculadas:

5 Cabezuelas axilares más o menos pedunculadas..... Subsect. Axiliflorae (Schau.) Briq.

5a Cabezuelas semiglobosas, con muchas flores agrupadas, más o menos pedunculadas, en inflorescencia terminal, más o menos paniculada o cimoso-paniculada....Subsect. Paniculatae (Schau.) Briq."

Gunawardena (1968) informs us that the genus was named in honor of Augustus Lippe (1678--1704), a French traveler [other writers say that he was an Italian traveler] who "preferred a journey to Egypt and Ethiopia to a Doctor's degree and was stabbed by robbers in Abyssinia". He accompanied an embassy to the King of Abyssinia. Dandy (1967) informs us that under the present edition of the International Code the name, Lippia, should be credited formally to Linnaeus. I still prefer, however, to credit it to William Houstoun (1695--1733), as Linnaeus himself did when he first adopted the name. There seems to me no valid ethical reason for not "giving credit where credit is due"

It is worth noting here that "Zipania Pers." is given by Jackson (1895) as a synonym of Lippia and is credited to Pers., Syn. Pl. 2: 140 (1807), but I fail to find this spelling of the generic name anywhere on that page or in the volume index -- the

spelling "Zapania", however, is there. Airy Shaw (1966) credits "Zapamia" to Post & Kuntze, but these authors plainly credit it to Jussieu, giving no bibliographic reference nor binomial under it for verification. It seems proper, therefore, to leave this name in the synonymy of Lippia. Airy Shaw also includes Zapania Lam. and Zappania Zuccagni in the synonymy of Lippia, but both these names belong in the synonymy of Priva Adans. The Zapania Scop., Cryptocalyx Benth., Panope Raf., and Piarimula Raf., which he also still regards as synonyms of Lippia, belong in the synonymy of Phyla Lour.

The Hippia of Linnaeus, referred to in the synonymy above, is a valid genus in the Carduaceae, while that credited to Kunth and to Linnaeus filius are synonyms of Plagiocheilus Arn., also in the Carduaceae. The Zappania Scop., Platonis Raf., and Bertolonia Raf., included in Lippia by Spach (1840) belong in the synonymy of Phyla Lour.

Estimates of the number of valid species in Lippia have varied considerably over the years. In 1877 Baker estimated 80, while in 1900 he reduced this to 60; in 1901 Pearson estimated 110; in 1965 Ohwi said "About 100 species, chiefly in the New World"; in 1967 Cooke said "110 species chiefly Tropical America and Africa"; in 1973 Thorne gave 220 species as the probable number, "of which 205 are American, 15 African, and none in Madagascar". Gibson (1970) says "A few herbaceous species of this genus have been treated by Moldenke and some earlier workers as constituting a distinct genus, Phyla, but I prefer to leave them, as most authorities have, in Lippia. Nearly 200 species have been reported, the majority of them from tropical America. Additional studies may result in the reduction of a considerable number of them to synonymy." My own studies accept 213 species and 61 named forms and varieties.

Raju (1969) separates Aloysia and Phyla from Lippia as follows:

1. Calyx campanulate, short, 2--4-lobed. Lippia.

1a. Calyx cylindric, long, 5-lobed.

2. Flowers in lax elongated spikes. Aloysia.

2a. Flowers in dense subcapitate heads. Phyla.

Tomlinson (1973) and Troncoso (1961) report finding dioecism in "several species" of Lippia (as well as in Aegiphila and Citharexylum). Whipple (1972) asserts that "floral vascularization patterns in Stachytarpheta, Lippia, and Lantana of the Lantaneae and Phryma are basically alike. Therefore, this study proposes that Phryma be accorded tribal status in the subfamily Verbenoideae [as it was by Bentham a century ago!] because of its close affinities with Lantaneae of the Verbenoideae and that the tribe Phrymeae maintain tribal distribution [sic] because of its distinct swollen internodal zone and distinct fruit type." I regard Phrymaceae Schau. as a distinct family, as I do the Avicen-

niaceae, Stilbaceae, Symphoremaceae, Dicrastylidaceae, and Nyctanthaceae. Hutchinson also regards it as a separate family.

It is perhaps worth noting here that the Blume (1826) reference in the bibliography of Lippia, above, is sometimes mis-cited as "1825". The Hooker & Arnott (1836) work is often cited as "1841", but pages 192--299 were actually issued in 1836; the Endlicher (1838) reference is often cited as "1836--1856", but the pages involved here were actually issued in 1838. Similarly, the Schnitzlein (1856) reference is sometimes cited as "1843-1870", but the part involved here was published in 1856. The Sprengel (1827) work is sometimes mis-cited as "1871". The Boissier (1879) reference is often cited as "1875", but only pages 1--280 were issued in 1875; pages 281--1276 were not issued until 1879. Similarly, the Oppenheimer & Evenari (1941) work is sometimes cited as published in "1948" and the Buscalioni & Roccella (1923) paper as "1922". The index to Knoche's work (1923, 1974) refers to page "267" for Lippia, but I fail to find any mention of the genus on that page. The Wolden (1934) reference is usually dated "1932", but according to the late botanical bibliographer, Dr. John Hendley Barnhart, in a personal communication to me, it was not actually published until 1934. He also authenticated for me the Humboldt, Bonpland, & Kunth (1817, 1818) reference dates in the bibliography of Lippia. The Angely (1971) work is often cited as "1970", the title-page date, but according to Angely himself it was not actually published until 1971. Similarly, the Täckholm & Boulos (1974) work was actually issued on November 20, 1974, not in "1972" as stated on the title-page. The Lecomte (1935) work is often cited as "1934", but actually pages 609--896 of the volume involved here were not issued until 1935.

Barroso (1957) records and describes an unidentified species of Lippia from Brazil. Williams (1949) records "mpambake" as the vernacular name in Zanzibar for another unidentified Lippia, but L. javanica (Burm. f.) Spreng. is the only species of the genus known to me from that island and the vernacular name therefore probably applies to that species. He says that its leaves are used medicinally there. Ohwi (1965) records "iwadare-sō zoku" as the name used in Japan for the genus as a whole; Planer (1775) records "lippie" as the popular name for the genus in Germany. Martínez-Crovetto (1964) records "lauro" [meaning "flower"] for an unidentified Lippia known to the Amerinds of the Chaco. Martínez (1969) lists a "Lippia sp.", called "tequistepec" in Oaxaca, Mexico, where it is "Usan el cocimiento para lavar heridas y fistulas". Martin and his associates (1951) report that the scrub jay in Florida eats the fruit of a Lippia sp. — the only species known to me from Florida is L. alba (Mill.) N. E. Br., but he may even be referring to a Phyla species. Puri (1960) records a "Lippia sp." from rock formations in the Laki range (which is of volcanic origin) in the Sind Desert biotic association in Pakistan, an area with both hot and sulphur springs, but the genus is unknown to me from Pakistan — un-

doubtedly he is here referring to a Phyla.

Gibbs (1974) reports saponins "absent or probably so" and tannins definitely absent from Lippia (but how many of its taxa were investigated?), while 6-hydroxyl-flavones, sterols, triterpenes, triterpenoid saponins and/or other sapogenins, and a member of the selinene group were definitely present and "Lippia is a photosensitizer (irritant) plant". Kariyone (1967) reports that for "Lippia spp....Dihydrolippione was believed to be a stereoisomer of the epoxide prepared from piperitone", according to Fester (1961, 1963).

Mayor (1913) records the fungus, Prospodium vongunteri, as attacking an unidentified species of Lippia, while Arthur (1918) found another species, P. lippiae, so doing. Jackson (1932) proposes a new species, Puccinia mariae Jacks., for a fungus which he found growing on an unidentified Lippia represented by Holway 1719 from Prata, São Paulo, Brazil, collected April 9, 1922. It is named in honor of Mrs. Mary M. Holway and he notes that "This species is very different from P. senilis Arth., in which the teliospore wall bears closely placed tuberculate-verrucose markings and has the apex considerably more thickened." Fedde (1938) records Prospodium lippiae (Speg.) Arth. from unidentified species of Lippia represented by Holway 364, 417, 661, 5084, & s.n. [Cuernavaca, Morelos, Jan. 1908] and E. E. Rogers s.n. [Austin, spring 1921]. He re-identifies Jackson's Puccinia mariae on Holway & Holway 1719 as Prospodium peruvianum (Syd.) Cumm. He likewise records Prospodium elatipes (Arth. & Holw.) Cumm. from an unknown Lippia represented by Holway 307 from Costa Rica. Bisby (1943) reports that Cummins had up to that time found no less than eight species of Prospodium attacking species of Lippia. Yarwood (1957) reports that the powdery mildew, Erysiphe cichoracearum, infests species of Lippia in California. It is not certain in any of these cases that the authors are referring to actual species of Lippia or, instead, to a Phyla or an Aloysia.

The Petrak Cumulative Index (1957) lists the following fungi from unidentified Lippia species: Fusidium bruchianum, Meliola durantae var. lippiae, Phomopsis citriodora, Puccinia mariae, Sphaceloma lippiae, and Sphaerella lippiae. Hansford (1961) also lists Meliola durantae var. lippiae Cif. from a Bermuda Lippia, based on Thaxter s.n. and Whetzel 34587. Since there is no true Lippia known from the Bermuda Islands, it must be a Phyla to which he is here referring. Westcott (1971) records the following fungi as causing serious diseases in Lippia species [probably, again, meaning Phyla]: bacterial crown gall (Agrobacterium tumefaciens) in Arizona, black mildew (Meliola lippiae) in Florida and Arizona, southern blight (Sclerotium rolfsii) in Arizona and California, leaf spot (Cercospora lippiae) widespread and another leaf spot (Cylindrosporium lippiae) in Texas only. She also records the pests, root knot nematodes (Meloidogyne sp.) in

Arizona and spot anthracnose (Sphaceloma lippiae) in Indiana and Florida. Also reported as attacking Lippia are Meliola ambigua var. macrospora and Mycovellosiella ahmsii.

The Timmermann BT.99, distributed as Lippia sp., actually is Acantholippia seriphioides (A. Gray) Moldenke, while C. K. Dodge 77, F. R. Fosberg 45335, MacDougall S.9, Mears & Mears 3226, and Pittier 13177 are Lantana achyranthifolia Desf., J. S. Sobrinho 1401 is Lantana bahiensis Turcz., Hatschbach 18364, W. Hoehne 5583, F. W. Pennell 3589, Rusby & Pennell 305, and Teixeira 2824 [Herb. Serg. Tavares 1936] are Lantana fucata Lindl., D. Griffiths 6260, Rivas, Ostos, & McCart 8136, and M. S. Young 661 are Lantana macro-poda Torr., Stuessy 277 is Lantana microcephala A. Rich., Charetier 67 is Lantana tomasii Moldenke, Pennington 31 is Lantana velutina Mart. & Gal., Lundell & Lundell 12484 is Lantana velutina f. violacea Moldenke, C. C. Albers 62364 is Lantana viburnoides var. velutina Moldenke, and Mogg s.n. [10/1/38] is Lippia wilmsii H. H. W. Pearson, Eggers 14372 is Verbena litoralis H.B.K., and Burchell 5040, A. Chevalier s.n. [Ponta Grossa, 27 Août 1928], and Höringer 14665 are something non-verbenaceous, Wynd 721 is Buddleja sp. in the Buddlejaceae, Patterson & Quifones 90 is a mint, Azevedo 3 [Herb. Inst. Bot. S. Paulo 77488] is Hyptis sp. in the Lamiaceae, Gade P.311, P.312, & P.313 are Hyptis tafallae Benth., and Molina R. & Molina 22727 is something in the Myrtaceae.

In addition to the long list of binomials and trinomials proposed in Lippia but now excluded therefrom (as given by me in Phytologia 12: 25—39. 1965) are the following, with some emendations to names previously listed:

Lipia repens Sessé & Moc. = Phyla cuneifolia (Torr.) Greene

Lippea nodiflora Mich. = Phyla nodiflora (L.) Greene

Lippia aristata var. involucrata Hiern = Lantana aristata (Schau.) Briq.

Lippia aristata var. subsessilis Burkart = Lantana aristata var. subsessilis Moldenke

Lippia brasiliensis A. R. Schultz = Lantana brasiliensis Link

Lippia canescens Knuth = Phyla nodiflora var. canescens (H.B.K.) Moldenke

Lippia canescens Rich. = Phyla nodiflora var. reptans (Spreng.) Moldenke

Lippia canescens Robinson = Phyla nodiflora var. reptans (Spreng.) Moldenke

Lippia canescens var. uncinuligera (Nees) Gay = Phyla nodiflora var. rosea (D. Don) Moldenke

Lippia canescens repens Perry = Phyla nodiflora var. canescens (H.B.K.) Moldenke

Lippia chamaedrifolia (Cham.) Steud. = Aloysia chamaedryfolia Cham.

Lippia chilensis Schau. in DC. = Aloysia salviaefolia (Hook. & Arn.)

Moldenke

- Lippia citridora H.B.K. = Aloysia triphylla (L'Hér.) Britton
Lippia citriodora H.B.K. = Aloysia triphylla (L'Hér.) Britton
Lippia citriodora (Ort.) H.B.K. = Aloysia triphylla (L'Hér.) Britton
Lippia cuneifolia var. incisa (Small) Blankinship = Phyla nodiflora var. incisa (Small) Moldenke
Lippia cuneifolia var. incisa (Small) Lindheimer = Phyla nodiflora var. incisa (Small) Moldenke
Lippia cymbosa Wilder = Phyla scaberrima (A. L. Juss.) Moldenke
Lippia deserticola F. Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
Lippia deserticola R. A. Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
Lippia dulcis Trevia = Phyla scaberrima (A. L. Juss.) Moldenke
Lippia dulcis var. mexicana Hegi = Phyla scaberrima (A. L. Juss.) Moldenke
Lippia dulcis mexicana Kraemer = Phyla scaberrima (A. L. Juss.) Moldenke
Lippia geminata var. lochartii López-Palacios = Lantana lockhartii (Griseb.) D. Don.
Lippia grisebachiana Hieron. = Aloysia gratissima (Gill. & Hook.) Troncoso
Lippia grisebachii Troncoso = Lantana grisebachii Stuck.
Lippia herrerae Moldenke = Aloysia herrerae Moldenke
Lippia imbricana Kuntze = Lantana achyranthifolia Desf.
Lippia incisa E. D. Schulz = Phyla nodiflora var. incisa (Small) Moldenke
Lippia incisa Small = Phyla nodiflora var. incisa (Small) Moldenke
Lippia incisa (Small) Tidestr. = Phyla nodiflora var. incisa (Small) Moldenke
Lippia incisa Tidestr. = Phyla nodiflora var. incisa (Small) Moldenke
Lippia lanceolata var. cognita Fern. & Grisc. = Phyla lanceolata (Michx.) Greene
Lippia lanceolata var. reconita Fern. & Grisc. = Phyla lanceolata (Michx.) Greene
Lippia lanceolata var. xanthocarpa Unger = Phyla lanceolata (Michx.) Greene
Lippia ligustrina Kearney & Peebles = Aloysia gratissima (Gill. & Hook.) Troncoso
Lippia ligustrina Trev. = Aloysia gratissima (Gill. & Hook.) Troncoso
Lippia ligustrina schulzii Standl. = Aloysia gratissima var. schulzae (Standl.) Moldenke
Lippia ligustrinifolia Thuret = Citharexylum ligustrinum Van Houtte

- Lippia linearis Humb. = Phyla linearis (H.B.K.) Troncoso & López-Palacios
- Lippia linearis Humb. & Bonpl. = Phyla linearis (H.B.K.) Troncoso & López-Palacios
- Lippia linearis H.B.K. = Phyla linearis (H.B.K.) Troncoso & López-Palacios
- Lippia linearis Humb. & Kunth = Phyla linearis (H.B.K.) Troncoso & López-Palacios
- Lippia linearis Kunth = Phyla linearis (H.B.K.) Troncoso & López-Palacios
- Lippia linguistrinifolia El-Gazzar & Wats. = Citharexylum ligustrinum Van Houtte
- Lippia lycioides (Cham.) Steud. = Aloysia gratissima (Gill. & Hook.) Troncoso
- Lippia lycioides Staudt. = Aloysia gratissima (Gill. & Hook.) Troncoso
- Lippia macrophylla R. A. Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia megapotamica Spreng. = Lantana montevidensis (Spreng.) Briq.
- Lippia microphylla F. Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia microphylla R. A. Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia montevidense Spreng. = Lantana montevidensis (Spreng.) Briq.
- Lippia nodiflora (C. Bauhin) Michx. = Phyla nodiflora (L.) Greene
- Lippia nodiflora Benth. = Phyla nodiflora var. rosea (D. Don) Moldenke
- Lippia nodiflora (L.) L. C. Rich. ex Michx. = Phyla nodiflora (L.) Greene
- Lippia nodiflora (L.) Rich. ex Schau. = Phyla nodiflora (L.) Greene
- Lippia nodiflora (L.) R. Schauer = Phyla nodiflora (L.) Greene
- Lippia nodiflora f. maritima Simpson = Phyla nodiflora (L.) Greene
- Lippia nodiflora var. normalis f. sericea Kuntze = Phyla strigulosa var. sericea (Kuntze) Moldenke
- Lippia nodiflora var. repanda (H.B.K.) Kuntze = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia nodiflora var. repens Fern. = Phyla nodiflora (L.) Greene
- Lippia nodiflora var. reptans (H.B.K.) Kuntze = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia nodiflora var. reptans Kuntze = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia nodiflora var. rosea (D. Don) Macbr. = Phyla nodiflora var. rosea (D. Don) Moldenke
- Lippia nodiflora var. rosea (D. Don) Munz = Phyla nodiflora var. rosea (D. Don) Moldenke

- Lippia nodiflora var. rosea Thomas = Phyla nodiflora var. rosea (D. Don) Moldenke
- Lippia nodiflora var. sericea Kuntze = Phyla strigulosa var. sericea (Kuntze) Moldenke
- Lippia nodiflora var. sericea f. brevipes Kuntze = Phyla strigulosa var. sericea (Kuntze) Moldenke
- Lippia nodiflora var. strigulosa (Mart. & Gal.) Macbr. = Phyla strigulosa (Mart. & Gal.) Moldenke
- Lippia nodiflora ♂ normalis Kuntze = Phyla nodiflora (L.) Greene
- Lippia nodiflora ♂ normalis f. brevipes Planch. = Phyla nodiflora (L.) Greene
- Lippia nodiflora ♂ normalis f. sericea Kuntze = Phyla strigulosa var. sericea (Kuntze) Moldenke
- Lippia nodiflora ♀ lanceolata (Michx.) Wood = Phyla lanceolata (Michx.) Greene
- Lippia nodiflora repens Fern. = Phyla nodiflora (L.) Greene
- Lippia nodiflora sarmentosa Schau. = Phyla nodiflora (L.) Greene
- Lippia nodiflora Rich. = Phyla nodiflora (L.) Greene
- Lippia nudiflora L. = Phyla nodiflora (L.) Greene
- Lippia nudiflora Rich. = Phyla nodiflora (L.) Greene
- Lippia polystachia Farnsworth = Aloysia polystachya (Griseb.) Moldenke
- Lippia polystachia Farnsworth, Blomst., Quim., & Schermerh. = Aloysia polystachya (Griseb.) Moldenke
- Lippia purpurea Armano = Lantana trifolia L.
- Lippia purpurea Yacg. = Lantana achyranthifolia Desf.
- Lippia queretensis Humb. & Bonpl. = Phyla strigulosa (Mart. & Gal.) Moldenke
- Lippia repens Bert. = Phyla nodiflora (L.) Greene
- Lippia repens H.B.K. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans Humb. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans Humb. & Bonpl. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans H.B.K. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans Humb. & Kunth = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans Kunth = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans L. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans (Spreng.) H.B.K. = Phyla nodiflora var. reptans (Spreng.) Moldenke
- Lippia reptans sensu Griseb. = Phyla strigulosa (Mart. & Gal.) Moldenke

- Lippia salsoloides Benth. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salsoloides Benth. & Hook. f. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salsoloides Briq. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salsoloides (Griseb.) Benth. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salsoloides (Griseb.) Benth. & Hook. f. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salsoloides (Griseb.) Briq. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia salviaefolia Jacq. = Lantana rugosa Thunb.
- Lippia salvifolia Jacq. = Lantana rugosa Thunb.
- Lippia salzmanni Moldenke = Lantana salzmanni Schau.
- Lippia scoronoides H.B.K. = Aloysia scoronoides (H.B.K.) Cham.
- Lippia seriphioides (Moldenke) A. Gray = Acantholippia seriphioides (A. Gray) Moldenke
- Lippia stoechadiflora Anderss. = Phyla stoechadifolia (L.) Small
- Lippia trifida var. gracilis Phil. = Acantholippia deserticola (R. A. Phil.) Moldenke
- Lippia triflora L. = Lantana triflora L.
- Lippia turnerifolia var. camporum Griseb. -- to be deleted
- Lippia urticoides Steud. = Aloysia virgata (Ruíz & Pav.) A. L. Juss.
- Lippia viticifolia Heiner = Aloysia virgata (Ruíz & Pav.) A. L. Juss.
- Lippia wrightii var. macrostachya Torr. = Aloysia macrostachya (Torr.) Moldenke

LIPPIA ABYSSINICA (Otto & Dietr.) Cuf.

Additional synonymy: Lippia adoensis "Hochst. ex Schauer" apud Lugard, Kew Bull. Misc. Inf. 1939: 95. 1939. Lippia adoensis "Hochst. ex Schau." apud Moldenke, Fifth Summ. 2: 549, in syn. 1971 [not L. adoensis Auct., 1962, nor R. Fries, 1947, nor sensu Hutch. & Dalz., 1963]

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Afric. 179 & 180. 1954; Dale & Greenway, Kenya Trees 588. 1961; Hansford, Sydowia Ann. Myc., ser. 2, Beih. 2: 691. 1961; Gledhill, Check List Flow. Pl. Sierra Leone 30. 1962; W. Zimmerm., Excerpt. Bot. A.5: 478. 1962; Anon., Excerpt. Bot. A.6: 447. 1963; Meikle in Brenan & al., Kew Bull. 17: 173. 1963; Hocking, Excerpt. Bot. A.10: 270--271. 1966; Bouquet, Invent. Pl. Méd. & Tox. Cong. Braz. 33. 1967; W. G. Burger, Fam. Flow. Pl. Ethiop. fig. 60 (1). 1967; Hocking, Excerpt. Bot. A.11: 504 (1967) and A.12: 425. 1967; Moldenke, Biol. Abstr. 49: 4199. 1968; Uphof, Dict. Econ. Pl., ed. 2, 315. 1968; Cuf., Bull. Jard. Bot. Nat. Belg. 39: Suppl. 31. 1969; Farnsworth, Blomster, Quimby, & Schermerh., Lynn Index 6: 264. 1969; Anon., Assoc. Étud. Tax. Fl. Afr. Trop. Index 1969: 61. 1970; G. Taylor, Ind. Kew. Suppl. 14: 79. 1970; Vergiat, Journ. Agr. Trop. Bot. Appl. 17: 336. 1970; Moldenke, Fifth Summ. 1: 211, 212, 215, 218, 222, 227, 230, 233, 234, 241, & 244 (1971) and 2: 534, 542, 549, 565, & 889. 1971; Rovesti, Riv. Ital. Es-senz. Prof. Piant. Off. 54: 254--258. 1972; Moldenke, Phytologia 23: 420 (1972) and 25: 240. 1973; Howes, Dict. Useful Pl. 104. 1973; Farnsworth, Pharmacog. Titles 9 (6): vi & 501. 1974; Heslop-Harrison, Ind. Kew. Suppl. 15: 80. 1974; A. L. Moldenke, Phytologia 29: 172. 1974; Troncoso, Darwiniana 18: 336 & 410. 1974; Jaeger & Moldenke, Phytologia 30: 387 & 389 (1975) and 34: 260, 261, & 269. 1976.

Additional illustrations: W. G. Burger, Fam. Flow. Pl. Ethiop. fig. 60 (1). 1967.

Recent collectors describe this plant as a much-branched shrubby bush or subshrub, suffrutescent and much-branched as the base, 3--4 feet tall, or as an aromatic flowering bush with an upright, single, branching stem, the stems purplish, the sap clear, the leaves sparse, strongly aromatic, "suggesting lemon", and the flowers fragrant. The corollas are said to have been "creamy-white" on Verdcourt 973, "white and yellow" on Tanner RT.4032, and "lavender with a yellowish-white eye" on F. G. Meyer 7448. They have encountered it on shady banks, in high grass on hardpan, in waste ground, in heavy black soil, along roadsides, and, according to Albers, "common in roadside ditches". Kuls refers to it as a "häufiges Kraut an trockenen Stellen, Blüten violett". Lugard (1939) refers to it as "erect to 6 ft., leaves opposite, ternate or quadrate, very scabrid, flowers pale yellow, in subglobose shortly pedunculate axillary spikes...widely distributed in Tropical Africa", but it is very possible that he is referring here to L. chevalieri Moldenke, at least in part.

Irvine describes L. abyssinica as "A shrub 4--6 feet high; flowers white, fragrant, terminal" and asserts that "It occurs on grassy plains near the sea and also inland [in Ghana]. The leaves are fragrant and are dried in the sun, boiled in water and the extract drunk as tea with sugar. It relieves pain in the stomach and is laxative in its effects; it also cures fever. It is much liked by children as well as adults. The leaves are also cooked with food to relieve constipation."

Vergiat (1970) calls it an "Arbrisseau de savane à tiges annuelles, commun, croît par touffes de 2 m de haut environ; feuilles rigides, âpres au toucher, de teinte sombre. Floraison: fleurs blanches à bractées noires, très odoriférantes. La décoction des feuilles pour la boisson et le bain des fiévreux; bue, le matin à jeun, elle est vermifuge. On l'emploie aussi contre la dysenterie et certains maux de ventre.... Dans le cas de fatigue on se frictionne le corps avec la plante cuite dans l'eau. Le suc extrait par pressuration des racines est introduit dans les narines contre le coryza et sous les paupières contre les maux d'yeux. On tire de cette plante un sel utilisé comme médicament."

Robaté (1938) reports that the plant has a strong aromatic odor when fresh due to an essence which is extractable from the whole plant and is soluble in water. It consists of 72 percent carvone, 5 percent d-limonene, 2.4 percent phellandrene, and 3.4 percent terpene. Successive sublimates possess pure d-camphre.

Kerharo (1967) informs us that Lasnet claims that only 21 of all the plants of the area discussed [Senegal] which are claimed to have medicinal value actually do, including Lippia abyssinica or "le Thé de Gambie", of which he says "les feuilles donnent une infusion qui rappelle vaguement le Thé et dont la réputation est très surfaite" as a stimulant. He also comments that "pour sa richesse en camphre lévogyre le Lippia adoensis". It should be noted here that the name, "thé de Gambie", is applied also to Lippia chevalierii Moldenke. Other common names recorded for L. abyssinica (in addition to those previously reported by me) are "amaniena maniéna", "amaninié", "angankouin", "brégué balenté", "brégué mâle", "dāsuru", "fon", "futuro", "Gambian tea bush", "katien manéré", "kouatri", "ngireyi", "nounoun", "okan-koïno", "sourou nougban", "tea bush", and "vava". It has been found growing at altitudes of 1000—2600 meters, in flower in January, March to June, and August to November, and in fruit in January, March, May, and August to November. Roberty (1954) refers to it as "± rudéral, parfois gregaire". Irvine (1930) says that it is used in Ghana "for attracting bees and as a source of bush tea".

Farnsworth and his associates (1969) report the presence of 1- α -pinene, 1-camphene, cineole, 1-borneol, 1-camphor, sesquiterpene, carvone, d-limonene, and unidentified hydrocarbons in the volatile oil of the flowers. Uphof (1968) claims that it is the "source of a tea substitute which is much appreciated by the natives of some parts of west Africa and by Europeans".

Kerharo & Bouquet (1950) say: "Très répandu dans toute la zone de savane de la Côte d'Ivoire, le Lippia adoensis est un sous-arbrisseau, à feuilles verticillées odorantes et à petites fleurs blanches ou lilas, groupées en petites boules globuleuses très nombreuses. D'une façon général, les feuilles de Lippia sont utilisées sous forme de boissons théiformes contre toutes les manifestations fébriles. Contre les accès pernici-

eux les indigènes utilisent la décoction de la plante entière et complètent le traitement par de violentes frictions avec les feuilles fraîches. En Côte d'Ivoire cette verbénacée sert aussi à soigner les affections gastro-intestinales et les entérites: le décocté de feuilles est donné en boisson, tandis que celui de racines est pris en lavements.

"Comme beaucoup de plantes à essences, le Lippia adoensis est employé pour soigner les affections rhino-pharyngées, buccales et oculaires en particulier le conjonctivites; le suc de feuilles est donné en instillations oculaires ou nasales selon le cas. Enfin le Lippia entre dans différents traitements complexes de la maladie du sommeil et surtout des ictères graves (fièvre jaune). Cette espèce doit ses propriétés à une essence d'odeur menthée camphrée fournissant du camphre levogyre."

Tarr (1955) reports that Lippia abyssinica is attacked by the fungus Puccinia lippiivora (P. lippiicola) in the Sudan, while Hansford (1961) records the additional fungus, Meliola lippiae Maubl., from it as host in Sierra Leone and Dahomey, based on Deighton 3583 and LeTestu s.n.

It should be noted here that Lippia adoensis Auct. and L. adoensis R. Fries, referred to in the synonymy above, are synonyms of L. grandifolia Hochst., while the L. adoensis "sensu Hutch. & Dalz." is a synonym of L. savoryi Meikle.

Lugard (1939) cites his no. 109; Cufodontis (1962) cites Kuls 83 & 97; Irvine (1930) cites his no. 43 from Ghana. Baker (1900) erroneously includes L. grandifolia Hochst. in the synonymy of L. abyssinica. Chevalier (1911) cites his nos. 67 & 307, but, as I have stated before, I regard his no. 67 as L. chevalierii Moldenke; while his other collection has not as yet been seen by me, it more than likely will be found to represent the same species.

The Schlieben 319, distributed as L. abyssinica, actually represents L. javanica (Burm. f.) Spreng., while Breteler 574 & 826 and J. K. Morton 9911 & s.n. [18/10/1953] are L. multiflora Moldenke.

Additional citations: ETHIOPIA: C. A. Albers 61102 (Au—223860), 62002 (Au—224345), 62401 (Au—223452), 62460 (Au—224101); F. G. Meyer 7448 (W—2519756); Schimper II.1079 (Mu). TANGANYIKA: Tanner RT.4032 (Ba). KENYA: Verdcourt 973 (E—1649534).

LIPPIA ABYSSINICA var. PUBESCENS (Moldenke) Moldenke

Additional bibliography: Hocking, Excerpt. Bot. A.10: 271. 1966; Moldenke, Phytologia 14: 403. 1967; Moldenke, Fifth Summ. 1: 234 (1971) and 2: 549 & 889. 1971; Moldenke, Phytologia 34: 260 & 261. 1976.

[to be continued]